

REMARKS

Favorable consideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, and 3-17 are pending in the application, with Claims 5-10 and 12-17 having been withdrawn from consideration; Claims 1, 3, 4, and 11 having been amended; and Claim 2 having been cancelled by way of the present amendment.

In the outstanding Office Action, the election was made final; the drawings were objected to; Claim 2 was rejected under 35 U.S.C. § 112, second paragraph; Claims 1 and 11 were rejected under 35 U.S.C. § 102(e) as being anticipated by Ishii et al. (U.S. Patent No. 5,571,366, hereinafter Ishii); Claims 1 and 11 were rejected under 35 U.S.C. § 102(e) as being anticipated by Lee et al. (U.S. Patent No. 6,288,493, hereinafter Lee); Claim 4 was rejected under 35 U.S.C § 103(a) as being unpatentable over Lee; Claims 2-3 were rejected under 35 U.S.C § 103(a) as being unpatentable over Lee in view of Holland et al. (U.S. Patent No. 5,800,619, hereinafter Holland); Claim 4 was rejected under 35 U.S.C § 103(a) as being unpatentable over Ishii; and Claims 2-3 were rejected under 35 U.S.C § 103(a) as being unpatentable over Ishii in view of Holland.

With regard to the rejection of Claim 2 under 35 U.S.C. § 112, second paragraph, Claim 2 is hereby cancelled without prejudice or disclaimer and, thus, the rejection is moot.

Claims 1, 3, 4, and 11 are amended to correct a minor grammatical informality. No new matter is added.

Briefly recapitulating, Claim 1 is directed to a power supply antenna, comprising a plurality of coils disposed concentrically, the plurality of coils being prepared by bending a plurality of conductors each into a form of an arc. Power supply portions, formed at opposite ends of the respective coils so as to be connected to a high frequency power source, are located in different phases on a same plane. Independent Claims 3, 4, and 11 recite different

embodiments, each of which include power supply portions, formed at opposite ends of the respective coils so as to be connected to a high frequency power source, located in different phases on a same plane. Claim 11 recites a different system embodiment at least comprising the antenna recited in Claim 1. By placing the power supply portions in different phases on a same plane, electric fields generated at the power supply portions are optimally inhibited from disturbing the plasma.¹

Ishii discloses an antenna comprising divisional antennas and designed to decrease plasma density in the central portion of the antenna and uniformize plasma density in the radial direction as compared with a spiral coil.² In this regard, Ishii discloses a structure in which “the first one-turn radio frequency coil 116 and the second one-turn radio frequency coil 117 are coaxially arranged on the same plane at predetermined intervals.”³ However, Ishii does not disclose placing the power supply portions “in different phases on a same plane” as recited in Applicants’ independent Claims 1, 3, 4, and 11. In fact, nowhere in the Ishii reference is there any teaching of a specific coaxial displacement of the two coils. Nor is there any mention of coil-related electromagnetic field phase variation. Instead, Ishii teaches numerous embodiments of control circuits directed to phase manipulation, but none of these teachings mention coaxial displacement effects.⁴ Thus, Applicants submit the rejection of Claims 1 and 11 does not meet the burden of proving unpatentability as Ishii does not disclose or suggest all the elements of independent Claim 1 (or of independent Claims 3 and 4) and the inventions defined by Claims 1, 3, 4, and 11 are not anticipated and are not rendered obvious by Ishii for at least the reasons stated above.⁵

¹ Specification, page 5, lines 3-24

² Ishii, abstract

³ Ishii, column 16, lines 30-33; and Figure 24.

⁴ Ishii, Figures 26-31

⁵ MPEP § 2142 “...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of

In addition, Applicants note Ishii describes seven specific methods for controlling plasma.⁶ One method includes controlling the phase of the voltages for uniform distribution of the plasma. However, the plasma distribution being controlled is a radial distribution, not a circumferential distribution as taught in Applicants' pending invention. As none of the plasma control methods of Ishii include placing the power supply portions "in different phases on a same plane" as recited in Applicants' independent Claims 1, 3, 4, and 11, there is no teaching or suggestion for control of circumferential plasma distribution. Thus, Applicants submit it is only through an impermissible hindsight reconstruction of Applicants' invention that the rejection of Claims 1 and 11 can be understood.⁷

Lee discloses an antenna device with a plurality of coaxial coil antennas.⁸ However, like Ishii, Lee does not disclose placing the power supply portions "in different phases on a same plane" as recited in Applicants' independent Claims 1, 3, 4, and 11. In fact, nowhere in the Lee reference is there any teaching of a specific coaxial displacement of the two coils. Nor is there any mention of coil-related electromagnetic field phase variation. Thus, Applicants submit the rejection of Claims 1 and 11 does not meet the burden of proving unpatentability as Lee does not disclose or suggest all the elements of independent Claim 1 (or of independent Claims 3 and 4) and the inventions defined by Claims 1, 3, 4, and 11 are anticipated and are not rendered obvious by Lee for at least the reasons stated above.⁹

success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

⁶ Ishii, column 26, lines 39-61.

⁷ MPEP § 2143.01 "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge of one of ordinary skill in the art."

⁸ Lee, Figure 3.

⁹ MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Also, like Ishii, Lee teaches numerous embodiments of control circuits directed to phase manipulation, but none of these teachings mention coaxial displacement effects. For example, in Lee, “[t]he antenna device 100 also includes an impedance matching circuit 304 for achieving an impedance matching state between a plurality of antenna units 400a and 400b and the high frequency power source 102. At this time, a plurality of antenna units (400a, 400b) are kept in the resonant state by the variable load of the variable capacitor C_R 302a, which is the most important feature of the present invention.”¹⁰ Lee further discloses “[a]s a result, it is possible to efficiently transmit the energy supplied from the high frequency power source 102 to plasma 118 in the chamber 104 with an improved uniformity in the density of plasma.”¹¹ However, like in Ishii, the “uniformization of the plasma density” in Lee means the uniformization of the plasma density in the radial direction, not in the circumferential direction. As there is no teaching or suggestion for control of circumferential plasma distribution, none of the plasma control methods of Lee include placing the power supply portions “in different phases on a same plane” as recited in Applicants’ independent Claims 1, 3, 4, and 11. Thus, Applicants submit it is only through an impermissible hindsight reconstruction of Applicants’ invention that the rejection of Claims 1 and 11 can be understood.¹²

¹⁰ Lee, column 3, lines 49-58

¹¹ Lee, column 4, lines 29-32

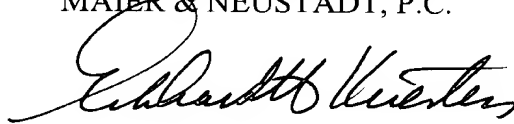
¹² MPEP § 2143.01 “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge of one of ordinary skill in the art.”

Applicants have also considered the Holland reference and submit Holland does not cure the deficiencies of either Ishii or Lee. Therefore, Applicants submit the rejection of Claims 2-3 under 35 U.S.C § 103(a) is improper and respectfully request this rejection be withdrawn.

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870
Michael E. Monaco
Registration No. 52,041



22850

Tel.: (703) 413-3000

Fax: (703) 413-2220

EHK/MEM/kkn

I:\atty\Mm\AMENDMENT\231828\209667us-am.doc



1/12

FIG. 1
PRIOR ART

